

WHAT IS CLAIMED IS:

1. A support system, comprising:
a support post having a tapered face; and
support means for adjustably supporting a member to said support post,
said support means including a locking mechanism movable between a first
position for press-fitting said support means against the tapered face of said
support post and a second position for releasing the press-fitting, said locking
mechanism having a surface that abuts said tapered face of said support post when
in the first position thereby to effect said press-fitting and that is released from the
tapered face of said support post when moved to said second position to release
said press-fitting.
2. A support system according to claim 1, wherein said support means
comprises a collar adapted to be structurally associated with the supported
member, and said locking mechanism is rotatably supported by said collar, with
said locking mechanism and said collar forming a sleeve surrounding said support
post.
3. A support system according to claim 2, wherein said collar is contoured to
complement a cross-sectional shape of said support post.
4. A support system according to claim 3, wherein said support post has a
generally triangular cross-section with a rounded right angular apex.
5. A support system according to claim 3, wherein said support post has a
generally D-shaped cross-section.
6. A support system according to claim 3, wherein said collar comprises first
and second lateral sides and a rear section, connecting said first and second lateral
sides, having a shape to complement the cross-sectional shape of said support post.

7. A support system according to claim 6, wherein said collar further comprises means for securing said locking mechanism.
8. A support system according to claim 7, wherein said securing means comprises a cylindrical shaft secured between said first and second lateral sides of said collar.
9. A support system according to claim 8, wherein said cylindrical shaft is secured between upper portions of said first and second lateral sides of said collar.
10. A support system according to claim 8, wherein said cylindrical shaft is secured between middle portions of said first and second lateral sides of said collar.
11. A support system according to claim 8, further comprising a sleeve, said sleeve being contoured to fit between said collar and said post.
12. A support system according to claim 1, wherein said support post is formed so as to have plural tapered faces spaced along its length.
13. A support system according to claim 1, wherein said locking mechanism has a rear face mating with an outer surface of the tapered face of said support post.
14. A support system according to claim 13, wherein said outer surface and said rear face are substantially flat to complement each other.
15. A support system according to claim 13, wherein said outer surface is convex and said rear face is concave to complement each other.
16. A support system according to claim 1, wherein when said locking mechanism is in the second position, the support means can pass over the tapered face of said support post.

17. A support system according to claim 1, with said support means being translatable relative to said support post, wherein when said support means translates in a first direction said locking mechanism passes over the tapered face of said support post and when said support means translates in a second direction said locking mechanism seats on the tapered face of said support post and creates a wedging force.
18. A support system according to claim 17, further comprising means for actuating said locking mechanism toward the second position when said support means slides in the first direction or second direction to allow said locking mechanism to pass over the tapered face of said support post.
19. A support system according to claim 1, wherein said locking mechanism rotates about an axis when said surface abuts the tapered face of said support post.
20. A support system according to claim 1, wherein said locking mechanism rotates about an axis transverse to a longitudinal axis of said support post when said surface abuts the tapered face of said support post.
21. A support system according to claim 1, wherein said support post is made by the roll-form process.
22. A support system according to claim 1, wherein said support post is made by the hydro-forming process.
23. A support system according to claim 1, wherein said support post is made by the pultrusion process.
24. A system for supporting a member, said system comprising:
a support post having a longitudinal axis and a tapered face; and

support means adapted to be secured to the member, for supporting the member to said support post, said support means forming a sleeve around said support post and seated on said support post on the tapered face thereof, wherein said support means including a locking mechanism that is actuatable between a first position compressing the tapered face and supporting the member and a second position not compressing the tapered face.

25. A system according to claim 24, wherein said locking mechanism in the first position supports the member by a wedge action with said tapered face.
26. A system according to claim 24, wherein said locking mechanism in the second position releases the compressive force applied to the tapered face of said support post.
27. A system according to claim 24, wherein said locking mechanism in the second position is slidable over the tapered face of said support post.
28. A system according to claim 24, wherein said support assembly comprises a collar adapted to be structurally associated with the member, with said locking mechanism rotatably supported on said collar.
29. A system according to claim 28, wherein said locking mechanism has a rear face mating with an outer surface of the tapered face.
30. A system according to claim 29, wherein said outer surface and said rear face are substantially flat to complement each other.
31. A system according to claim 29, wherein said outer surface is convex and said rear face is concave to complement each other.
32. A system according to claim 29, wherein said outer surface is angled and said rear face has an angled cavity to complement each other.

33. A system according to claim 29, wherein said outer surface has a raised vertical section thereof.
34. A system according to claim 28, wherein said collar includes first and second lateral sides and a rear section connecting said first and second lateral sides, said rear section shaped to complement a contour of said support post.
35. A system according to claim 34, wherein said support post has a generally triangular cross-section with a rounded right angular apex.
36. A support system according to claim 34, wherein said support post has a generally D-shaped cross-section.
37. A system according to claim 34, wherein said collar further comprises means for securing said locking mechanism.
38. A system according to claim 37, wherein said securing means comprises a cylindrical shaft secured between said first and second lateral sides of said collar.
39. A system according to claim 38, wherein said cylindrical shaft is secured between upper portions of said first and second lateral sides of said collar.
40. A system according to claim 38, wherein said cylindrical shaft is secured between middle portions of said first and second lateral sides of said collar.
41. A system according to claims 28, wherein said locking mechanism has a flat lower portion.
42. A system according to claim 28, wherein said locking mechanism has a rounded lower portion.

43. A system according to claim 28, wherein said locking mechanism has an elongated lower portion forming a handle.
44. A system according to claim 24, with said sleeve receiving said support post and translatable relative thereto, wherein when said support assembly translates in a first direction said locking mechanism passes over the tapered face of said support post and when said support assembly translates in a second direction said locking mechanism seats on the tapered face of said support post and creates a wedging force.
45. A system according to claim 24, further comprising means for actuating said locking mechanism toward the second position when said support assembly slides in the first direction and the second direction to allow said locking mechanism to pass over the tapered face of said support post.
46. A system according to claim 24, wherein said support post includes a plurality of tapered faces extending along a length of said support post.
47. A system according to claim 24, wherein said support post is made by the roll-form process.
48. A system according to claim 24, wherein said support post is made by the hydro-forming process.
49. A system according to claim 24, wherein said support post is made by the pultrusion process.
50. A support system, comprising:
 - a support post;
 - a wedge member, having a tapered portion, located on said support post, said wedge member having a securing portion; and

support means for adjustably supporting a supported member to said support post, said support means including a locking mechanism movable between a first position for press-fitting said wedge member against said support post and a second position for releasing said press-fitting, said locking mechanism having a surface that abuts said wedge member when in the first position thereby to effect said press-fitting and that is released from said wedge member when moved to said second position to release said press-fitting, said locking mechanism cooperating with said securing portion of said wedge member so that said wedge member and said support means remain engaged with one another even when the support means is in the second position.

51. A support system according to claim 50, wherein said support means comprises a collar adapted to be structurally associated with the supported member, and said locking mechanism is rotatably supported by said collar, with said locking mechanism and said collar forming a sleeve surrounding said support post.

52. A support system according to claim 51, wherein said collar is contoured to complement a cross-sectional shape of said support post.

53. A support system according to claim 52, wherein said support post has a generally triangular cross-section with a rounded right angular apex.

54. A support system according to claim 52, wherein said support post has a generally round cross-section.

55. A support system according to claim 52, wherein said collar comprises first and second lateral sides and a rear section, connecting said first and second lateral sides, having a shape to complement the cross-sectional shape of said support post.

56. A support system according to claim 55, wherein said collar further comprises means for securing said locking mechanism.

57. A support system according to claim 56, wherein said securing means comprises a cylindrical shaft secured between said first and second lateral sides of said collar.
58. A support system according to claim 50, wherein said tapered portion of said wedge member extends along its entire length.
59. A support system according to claim 50, wherein said tapered portion of said wedge member extends along part of its length.
60. A support system according to claim 50, wherein said tapered portion of said wedge member extends along a lower part of its length.
61. A support system according to claim 50, wherein said wedge member is engaged with said support post, with said locking mechanism having a rear face mating with an outer surface of said wedge member.
62. A support system according to claim 61, wherein said outer surface and said rear face are substantially flat to complement each other.
63. A support system according to claim 61, wherein said outer surface is convex and said rear face is concave to complement each other.
64. A support system according to claim 61, wherein said outer surface is angled and said rear face has an angled cavity to complement each other.
65. A support system according to claim 50, wherein said locking mechanism rotates about an axis when said surface abuts said wedge member.
66. A support system according to claim 50, wherein said locking mechanism rotates about an axis transverse to a longitudinal axis of said support post when said surface abuts said wedge member.

67. A support system according to claim 50, wherein:

(a) said collar comprises:

first and second lateral sides and a rear section connecting said first and second lateral sides, and

channels extending vertically in said first and second lateral sides; and

(b) said securing portion of said wedge member comprises studs extending from lateral sides of said wedge member,

said studs being cooperatively engaged in said channels of said collar so as to trap said wedge member within said support means.

68. A support system according to claim 50, wherein:

(a) said collar comprises:

first and second lateral sides and a rear section connecting said first and second lateral sides,

a first cylindrical shaft secured between said first and second lateral sides of said collar, said first cylindrical shaft securing said locking mechanism to said collar, and

a second cylindrical shaft secured between said first and second lateral sides of said collar at a point higher than said first cylindrical shaft; and

(b) said securing portion of said wedge member comprises an overhanging upper portion of said wedge member,

said overhanging upper portion of said wedge member being cooperatively engaged with said second cylindrical shaft so as to trap said wedge member within said support means.

69. A support system according to claim 68, said wedge member further comprising guide slots and said locking mechanism further comprising raised guide portions at an upper portion thereof, wherein said guide portions rotatably engage said guide slots when said locking mechanism moves from the second position to the first position.

70. A support system according to claim 68, said wedge member further comprising a spring molded into a rear face of said wedge member, the spring being compressed by said locking mechanism when said locking mechanism moves from the second position to the first position.

71. A support system according to claim 68, wherein said overhanging upper portion of said wedge member has an inwardly projecting detent to securely engage said overhanging upper portion with said second cylindrical shaft.

72. A support system according to claim 50, wherein:

(a) said collar comprises:

first and second lateral sides and a rear section connecting said first and second lateral sides; and

(b) said securing portion of said wedge member comprises studs extending from lateral sides of said wedge member, said studs being located at upper and lower portions of each of the lateral sides of said wedge member,

said wedge member and said collar being cooperatively engaged such that the studs remain above and below the lateral sides of said collar to trap said wedge member within said support means.

73. A support system according to claim 50, wherein:

(a) said collar comprises:

first and second lateral sides and a rear section connecting said first and second lateral sides, and

channels extending vertically in said first and second lateral sides;

(b) said securing portion of said wedge member comprises leaf springs extending from lateral sides of said wedge member, and a camming structure formed on an outer surface of said wedge member, said camming structure including first and second camming channels running parallel to one another and on opposite sides of said camming structure, each of said first and second camming channels being wider at an upper part of the camming structure and narrower at a lower part of said camming structure; and

(c) said locking mechanism comprises an upper portion having fingers formed thereon, said fingers facing one another with a gap therebetween, said wedge member, said collar and said locking mechanism being cooperatively engaged with one another such that said leaf springs remain within said channels of said collar to trap said wedge member within said support means and said fingers are positioned so as to move reciprocatingly within said first and second camming channels, wherein when said locking mechanism is in said second position, said fingers are located within the lower part of said first and second camming channels imparting a force tending to pry said wedge member away from said support post and placing said leaf springs in tension and, when said locking mechanism is moved to said first position, said fingers move to the upper part of the first and second camming channels, to apply a compression force to said wedge member to effect said press fitting and to release the tension in said leaf springs.

74. A support system according to claim 50, wherein:

(a) said collar comprises:

first and second lateral sides and a rear section connecting said first and second lateral sides, and

embossed channels extending vertically in said first and second lateral sides, said embossed channels being concave with respect to an interior of said collar; and

(b) said securing portion of said wedge member comprises spring members extending from lateral sides of said wedge member,

said wedge member, said collar and said locking mechanism being cooperatively engaged with one another such that end portions of said spring members rest within said channels of said collar to trap said wedge member within said support means and to bias the tapered face of said wedge member away from said support post when said locking mechanism is in said second position, and when said locking mechanism is moved to said first position, said locking mechanism places said spring members under tension by applying a compression force to said wedge member to effect said press fitting of said wedge member against said support post.

75. A support system according to claim 74, said wedge member further comprising guide slots, and said locking mechanism further comprising raised guide portions at an upper portion thereof, wherein said guide portions rotatably engage said guide slots when said locking mechanism moves from the second position to the first position.

76. A support system, comprising:

a support post; and

support means for adjustably supporting a member to said support post, said support means including a locking mechanism, which includes an integrally formed wedging member, said locking mechanism being movable between a first position for press-fitting said wedging member against said support post and a second position for releasing the press-fitting, said wedging member having a surface that abuts said support post when in the first position thereby to effect said press-fitting and that is released from said support post when moved to said second position to release said press-fitting.

77. A support system according to claim 76, wherein said support means comprises a collar adapted to be structurally associated with the supported member, and said locking mechanism is rotatably supported by said collar, with said locking mechanism and said collar forming a sleeve surrounding said support post.

78. A support system according to claim 77, wherein said collar is contoured to complement a cross-sectional shape of said support post.

79. A support system according to claim 78, wherein said support post has a generally triangular cross-section with a rounded right angular apex.

80. A support system according to claim 78, wherein said support post has a generally round cross-section.

81. A support system according to claim 78, wherein said collar comprises first and second lateral sides and a rear section, connecting said first and second lateral sides, having a shape to complement the cross-sectional shape of said support post.
82. A support system according to claim 81, wherein said collar further comprises means for securing said locking mechanism.
83. A support system according to claim 82, wherein said securing means comprises a cylindrical shaft secured between said first and second lateral sides of said collar.
84. A support system according to claim 76, wherein said wedging member of said locking mechanism has a rear face mating with an outer surface of said support post.
85. A support system according to claim 84, wherein said outer surface and said rear face are substantially flat to complement each other.
86. A support system according to claim 84, wherein said outer surface is convex and said rear face is concave to complement each other.
87. A support system according to claim 76, wherein said locking mechanism has a flat lower portion.
88. A support system according to claim 76, wherein said locking mechanism has a rounded lower portion.
89. A support system according to claim 76, wherein said locking mechanism has an elongated lower portion forming a handle.
90. A support system according to claim 76, wherein said locking mechanism rotates about an axis when said wedging member abuts said support post.

91. A support system according to claim 76, wherein said locking mechanism rotates about an axis transverse to a longitudinal axis of said support post when said wedging member abuts said support post.

92. A support system according to claim 82, wherein said locking mechanism has an upper portion comprising said wedging member, said wedging member comprising an inner wedging surface, a front face for mating with said support post, and an overhang lip, said overhanging lip and said inner wedging surface defining a channel, said inner wedging surface being tapered with respect to vertical,

said securing means of said collar being cooperatively engaged with said channel of said locking mechanism such that in the first position, said securing means contacts said inner wedging surface to produce a wedging force between said locking mechanism and said support post.

93. A support system according to claim 82, wherein said collar further comprises generally vertically oriented channels formed in said first and second lateral sides of said collar, and said locking mechanism comprises an upper portion comprising said wedging member, said wedging member comprising a front face adapted to contact said support post and a rear portion having a cylindrical channel formed therein, said support system further comprising a support pin having two end caps, said support pin being secured within said cylindrical channel with said end caps protruding from ends of said cylindrical channel,

said wedging member of said locking mechanism, said end caps of said support pin and said collar channels being cooperatively engaged with one another to allow reciprocating motion of said locking mechanism in the vertical direction such that when said locking mechanism is in the first position, said front face of said wedging member contacts said support post to apply a wedging force to effect the press fit.

94. A support system according to claim 93, wherein said generally vertically oriented channels are inclined upwardly rearwardly toward a back of said collar

such that when the member to be supported is loaded, said collar will move downwardly relative to said locking mechanism to urge said locking mechanism into tight engagement with said support post.

95. A support system according to claim 82, wherein said collar further comprises substantially L-shaped channels in each lateral side of said collar, said substantially L-shaped channels having a longer generally vertically oriented portion and a shorter horizontally oriented portion, and said locking mechanism has an upper portion comprising said wedging member, said wedging member comprising a front face adapted to contact said support post and a rear portion comprising a cylindrical channel, said support system further comprising a support pin having two end caps, said support pin being secured within said cylindrical channel with said end caps protruding from ends of said cylindrical channel,

said wedging member of said locking mechanism, said end caps of said support pin and said L-shaped channels being brought into cooperative engagement with one another by insertion of said end caps into said horizontally oriented portion of said L-shaped channels followed by insertion of said end caps into said vertically oriented portion of said L-shaped channels to allow reciprocating motion of said locking mechanism in the vertical direction such that when said locking mechanism is in the first position, said front face of said wedging member contacts said support post to apply a wedging force to effect the press fit.

96. A support system according to claim 95, wherein said generally vertically oriented portions of said L-shaped channels are inclined upwardly rearwardly toward a back of said collar such that when the member to be supported is loaded, said collar will move downwardly relative to said locking mechanism to urge said locking mechanism into tight engagement with said support post.